

EWH Chapter Impact Activities

Kit Builds

Kit Builds are an easy-to-organize activity that can build chapter membership and engagement that can lead to other projects and partnerships. EWH develops and sells Kits which provide students with hands-on training that promotes understanding of important biomedical engineering concepts and the practical electronic fabrication skills needed by both engineers and technicians. Chapters can use Kits as a fun group activity or as part of a service project to introduce K-12 students to STEM education and careers. Visit www.ewh.org/kits to learn more about the different models of Kits. Kits can also be used to innovate new Kit Projects, which are explained in more detail below.

Kit builds require some resources like an electronics lab, soldering irons, and solder. Chapters typically designate Kit Chairs that learn how the Kits work and lead a Kit building session for other members of the chapter. EWH provides presentations with background information on the purpose and function of the devices and why they are important in the healthcare setting. Chapter members typically work in teams of 2-3 per Kit to complete assembly. Once the Kits are assembled, they can be used for outreach programs or Kit projects, or returned to EWH to support education in low-resource settings.

Fundraising for a Kit build can serve as a concrete goal to kick-off the chapter's fundraising activities as well. Active chapters can apply for EWH Kit Aid to help. View the application form here for full details: <https://ewh.org/kitaid>

K-12 STEM Outreach

Introducing younger students to global health and engineering is one of the more impactful activities an EWH Chapter can organize. EWH Chapter members bring hands-on resources and mentoring to local schools, after-school programs, and STEM camps. EWH's K-12 STEM activities and Kits are a perfect fit for these programs, giving students a unique introduction to biomedical engineering, science and global health. Visit <https://ewh.org/teachbme> and <https://ewh.org/kits> to view these resources.

Starting an Outreach Program: Build Local Relationships

The first step to starting an outreach program is to find motivated partners who are interested in introducing students to biomedical engineering. Local schools, non-profits, and on-campus organizations are a good place to start. Groups that focus on K-12 STEM education are very common and can be found in most areas. Makerspaces and other DIY organizations may also be good partners.

Planning an Outreach Program

Once you've started building local relationships, you need to assign program leaders and answer these three questions:

- 1) What age group or grade are the student participants?
- 2) How much time is there for an activity?
- 3) What resources are available in the classroom, workshop or other space?

These questions can be answered during discussions between EWH Chapter members and outreach partners. If the chapter is interested in working with a certain age group, for example, the outreach program can focus on partners and activities that appeal to that age group.

Outreach activities

Next, choose an activity that is suited for the student age group and environment you'll be working with. Program partners can provide good advice on what kinds of activities might be best suited for their students. EWH's [TeachBME](#) webpage contains activities generally suited for younger students, while EWH Kits can be built by more advanced students. You can also develop your own program, using ideas from online resources and teachers, or develop a new activity as a chapter.

It's a good idea to include a presentation in the program to show students the many different fields of biomedical engineering with time for Q+A, so students can ask current engineering students about the field and classes. TeachBME has several presentations that can be used or edited for this part of the program, and EWH staff are always happy to work with chapters to help develop projects.

Preparing and executing an outreach program

You should practice the activity as a group before working with students. It's important to be familiar with how the activity works, understand where students may need extra help, and review any presentation you will make. Supplies should be organized ahead of time in order to maximize the activity time during the program. This often means packaging supplies for each student or group of students. Sometimes supplies may need to be distributed during the activity, so assigning specific group members to that task can be helpful. Keep partners informed of your plans: they can give great advice on how to make sure the program runs smoothly.

Finally, have fun! An outreach program may take a lot of effort to organize, but it is also very rewarding to share your experience and engage with younger students in biomedical engineering and global health!

Innovation and the EWH Design Competition

Kit Projects

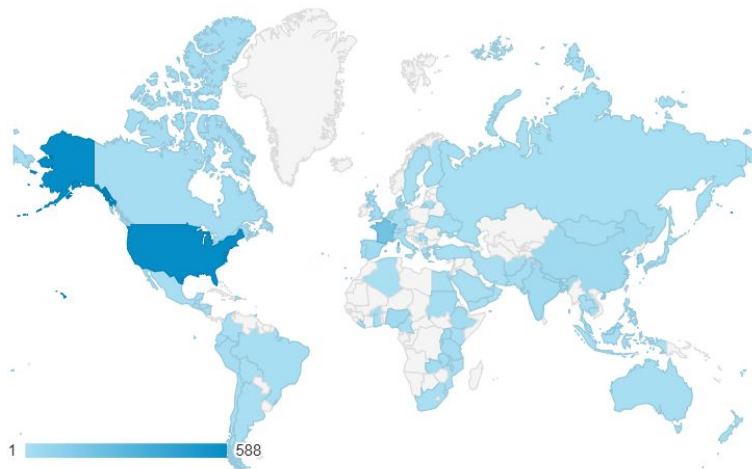
EWH Kit Projects are smaller engineering innovation projects that expand the educational impact of EWH Kits. These projects generally require less time and resources compared to larger design projects and focus on instrumentation concepts. Our goal is to make Kits a useful, open-source tool for STEM educators ranging from elementary school through early engineering education.

If a chapter is interested in developing an EWH Kit project, partnering with a STEM education organization or a department on campus could provide more guidance and ideas to increase the educational impact. EWH provides a list of ideas for Kit projects, but we welcome other concepts and approaches.

<https://share.ewh.org/forum/kit-projects>

Library.ewh.org Projects

A significant challenge for Biomedical Equipment Technicians (BMETs) in low-income countries is gaining access to reliable information to make repairs and perform maintenance on hospital equipment. Equipment manuals are often not included with donated equipment, and technical service manuals may be restricted by the equipment manufacturer. The BMET Library (library.ewh.org) is a free digital library containing resources for the repair, maintenance, and operation of medical equipment. Resources include equipment manuals, troubleshooting guides, educational resources, and best practices guidelines.



EWH BMET Library Users by Country

EWH is continually working to improve this resource and EWH Chapters can help. Projects include application development, creating instructional videos and finding additional resources. EWH is currently developing a hackathon program to improve access to the library and other tools that support BMETs in their mission to keep equipment functioning properly so quality care can be delivered.

<https://share.ewh.org/forum/innovation-and-design/bmet-library-development>

The EWH Design Competition

A well-designed technology appropriate for use in resource-poor settings can have a tremendous impact on the ability of a hospital to deliver health care. You can speak with your engineering faculty about offering EWH design projects as options to fulfill requirements for senior design projects for teams and individuals. In this way, you can offer an interesting alternative design project for the students at your school and take advantage of the time and guidance that is part of taking a design class.

EWH Institute participants contribute to the innovation environment by performing needs-finding interviews and generating detailed reports that serve as a good starting point for a design teams. EWH reviews these reports and posts promising concepts to the share.ewh.org webpages, found here: <https://share.ewh.org/forum/innovation-and-design/research-and-design-projects>

Chapters can also look for motivation on campus to develop a new concept that addresses low-resource healthcare delivery and global health. Specific departments and research groups dedicated to these challenges are a growing trend and a great resource for connecting the chapter to current on-campus work and a wider network of global health professionals. If your university is connected to a medical school, seeking out physicians and other healthcare professionals who travel abroad for service could lead to an innovative concept EWH has not yet encountered.

Chapters should be aware that a design project is one of the more resource-intensive activities a chapter can engage in. Depending on the project, specialized space, tools and supplies may be necessary. Many campuses have extensive resources available and your advisor may be able to help you secure what is needed to complete the project. These projects also take more time and dedication than other EWH activities, but their results have a high impact potential and are one of the best learning experiences for aspiring engineering innovators.

To be eligible to enter the Design Competition, at least one member of the Design Team must be a member of an EWH Chapter in good standing (affiliation paid). There are cash prizes for the top three winning teams. Participating teams are invited (but not required) to create a multi-disciplinary Design Team that brings engineering students together with industry engineers who have expertise in industrial design, social entrepreneurship, business planning, etc.

For more details visit: <https://ewh.org/chapters/design-competition/>

Global Service

EWH Chapters can engage in activities that have a more direct impact on global health as well. These activities often involve more logistics and planning compared to on-campus activities and outreach.

Medical Equipment Donation

Chapters can have a direct impact by evaluating, preparing, and even repairing medical equipment bound for developing countries. Some hospitals in developed countries replace medical equipment with newer models as often as every three or four years. This creates a large surplus of medical equipment that has been decommissioned from developed world hospitals, and much of this equipment is still serviceable.

Numerous charities have formed to manage equipment donations and ship these donations to hospitals and clinics in developing countries. These charities often look for volunteers for a variety of tasks, and chapters can provide their time and engineering expertise to ensure donations are appropriate and correctly prepared before they are shipped to low-resource hospitals around the world. This activity does require having a local charity partner engaged in this work. EWH maintains a list of charities but many smaller charities may not be on the list. Visit this webpage for more guidance and resources related to this activity: <https://ewh.org/donated-equipment-preparation/>

International Equipment Repair and Training

EWH Institute programs are high-impact programs where students and professionals travel to developing countries to assist hospitals by performing a variety of tasks, including medical equipment repair. EWH Chapters can form scholarships to send select students on EWH's two-month-long Summer Institute programs, or work with EWH and their department to start a new Campus to Country program.

If a chapter is interested in pursuing this activity, contact EWH. We may be able to provide some matching scholarship funds and, in the case of Campus to Country programs, we need to work with the campus administration to set up the partnership. Email chapters@ewh.org for more details.

Needs Finding and Site Visits

Chapters can independently organize short visits to developing countries to learn more about low-resource healthcare delivery and global health while experiencing new cultures. These trips must be organized through on-campus administration and **cannot include making repairs to medical equipment**. Appropriate independent activities include needs finding, training on available resources including library.ewh.org, inventory gathering, etc... Chapters should initiate their own in-country partnership with an NGO, healthcare provider, or other organization. For more guidance on how to organize this activity email chapters@ewh.org.

Other Chapter Activities

A successful EWH Chapter will choose to focus on only a few of the activities listed above, but other activities can be organized to keep members engaged. We encourage chapters to think of their own ways to learn about and contribute to global health and engineering. A good idea for a new activity at your chapter may be a good idea for other chapters as well, so keep EWH informed about any new activities that your chapter develops! Some past activities that have worked well include:

Clinical Exposure Events

By developing a close relationship with a local hospital, or the teaching hospital of your own university, you can request opportunities for chapter members to learn more about medical problems, the practice of medicine, and the importance of biomedical engineering to successful outcomes. Clinical exposure is one of the criteria for selection of students for EWH's Summer Institutes abroad. You may be able to arrange visits to the operating room or intensive care unit of the hospital, or for your members to spend a day shadowing a surgeon. You may also be able to visit the operating room of the local veterinary hospital.

Language Events

Foreign language skills and sensitivity toward other cultures is key to the success of Engineering World Health and other organizations that seek to improve the quality of health care in any developing country. Plan events to help your members develop cultural awareness. Another criteria for selection for the Summer Institute is foreign language exposure. You can simulate language and cultural barriers. For example, invite a guest speaker to come and teach enough vocabulary for very basic communication in a foreign language, perhaps one that nobody in your group knows; then have your members speak and understand each other in order to win a game (Simon Says or any other simple game is sufficient). There are also a number of excellent cross-cultural communication exercises that your group can download from the web.

Host a Panel Discussion or Conference

Invite speakers with expertise in international development, international health, or poverty alleviation to discuss current issues in global health. This is a great way to have your chapter members understand the context of the EWH mission and the work of the chapter. Topics could include education, economics, public health, and/or social entrepreneurship.

Food Night

Prepare food from a specific country or culture. These are great events to couple with a language class. This activity can be combined with a going-away or homecoming party for members participating in Institute programs.